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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,909	05/12/2006	Koudai Yoshizawa	040356-0588	3226

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EXAMINER	
CONLEY, OI K	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/578,909	YOSHIZAWA ET AL.	
	Examiner	Art Unit	
	HELEN O.K. CONLEY	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9,10 and 12-18* is/are pending in the application.

4a) Of the above claim(s) *12 and 13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9,10,14-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

1. Applicants' Amendment has been received on 6/7/10. Claim 9 has been amended. Claim 11 has been cancelled. Claims 17 and 18 are new.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

Claim Rejections - 35 USC § 112

3. The rejections under 35 U.S.C 112, second paragraph, on claims 9-11, 14-16 are withdrawn because Applicants amended the claims.

4. The rejections under 35 U.S.C 112, second paragraph, on claim 11 are withdrawn because Applicants cancelled the claims.

Claims Analysis

5. Regarding claim 15, it doesn't appear the "LLC" in "LLC passage" impart any structure to the fuel cell stack. The recitation "LLC" for the passage is noted as "intended use" language and it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

6. As best understood, please refer to the prior art rejections below.

Claim Rejections - 35 USC § 102

7. The rejections under 35 U.S.C 102(b) as being anticipated by Wada et al., on claims 9-11, 14-16 are maintained. The rejection is further clarified to parallel the claim amendments.

8. The rejections under 35 U.S.C 102(b) as being anticipated by Wada et al., on claim 11 is withdrawn because the Applicants cancelled the claim.

9.

10. The rejections under 35 U.S.C 102(b) as being anticipated by Inagaki et al. , on claims 9-11, 14-16 are withdrawn because the Applicants amended the claims.

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 9-11, 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Wada et al. (US Publication 2002/0192522 A1).

Regarding claim 9, the Wada et al. reference discloses fuel cell stack, comprising fuel cells (19)wherein a supply of an anode gas and a cathode gas for power generation. The fuel cell comprising an anode separator comprising an anode gas passage which has a meandering configuration with two or more bent portions (lower plate of Fig. 3) and a cathode separator comprising a cathode gas passage which has a

meandering configuration with bent portions (upper plate of Fig. 3). The number of bent portions of the cathode gas passage being equal to the number of the bent portions of the anode gas passage (Fig. 5). The cathode gas passage and the anode gas passage each having gas flows that are parallel and in opposite directions from each other (Fig. 5 and fig. 8). The separator further comprises outlet through-hole (34b or 33b) which is provided in a most downstream bent portion in at least one of the anode gas passage and the cathode gas passage, the through-hole allowing movement of moisture through the fuel cells.

Regarding claim 10, the Wada et al. reference discloses the fuel cell stack has a square shape cross-section and further comprises an anode gas supply manifold which supplies the anode gas to the anode gas passage of each fuel cell (33a) and an anode effluent exhaust manifold which recovers an anode effluent from the anode gas passage of each fuel cell (33b). The anode effluent exhaust manifold being arranged offset (Applicant's diagonally) with respect to the anode gas supply manifold in the cross-section of the fuel stack. A cathode gas supply manifold which supplies a cathode gas to the cathode gas passage of each fuel cell (34a) and a cathode effluent exhaust manifold which recovers cathode effluent from the cathode gas passage of each fuel cell (34b). The cathode effluent exhaust manifold being arranged offset (Applicants' diagonally) with respect to the cathode gas supply manifold in the cross-section of the fuel cell stack. The anode gas supply manifold and the cathode effluent exhaust manifold are arranged in parallel along a first side of the stacking surface of the fuel cell (Fig. 3 to the left of the stack), while the anode effluent exhaust manifold and the

cathode gas supply manifold are arranged in parallel along a second side (Fig. 3, to the right of the stack), which is opposed to the first side with respect to the cross-section of the fuel cell stack.

Regarding claim14, the Wada et al. reference discloses a drain manifold (all of the plates that connect 32b together) which drains water in the through-hole to outside of the fuel cell stack (Fig. 7).

Regarding claim 15, the Wada et al reference discloses a plurality of adjacent fuel cells (fig. 1, P29, P54) are provided with a coolant passage (32a) therebetween which is substantially superimposed in a stacking direction on the cathode gas passage and through which a coolant flows in the same direction as a cathode gas that flows (34a) in the cathode gas passage.

Regarding claim 16, the Wada et al. reference discloses the fuel cell stack comprises supply manifolds that respectively distribute the anode gas, the cathode gas, and the coolant to the fuel cells, and exhaust manifolds that respectively recover an anode gas, a cathode gas, and a coolant from the fuel cells, and wherein the anode gas supply manifold, the cathode gas exhaust manifold and the coolant exhaust manifold are located on the left side of Fig. 3, while the anode gas exhaust manifold, the cathode gas supply manifold and the coolant supply manifold are located on the right side of Fig.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US Publication 2002/0192522 A1) in view of Mizutani et al. (US Patent 7,309,541).

Regarding claims 17 and 18, the Wada et al. reference discloses the claimed invention above and further incorporated herein. While the Wada et al. reference further discloses the anode gas passage and the cathode gas passage comprises 4 or more even number of bent portions (Fig. 5 and Fig. 8) and further discloses a through hole for the reactant outlet at the most down stream bent portion of the anode and cathode gas passage, however, the Wada et al. reference is silent in disclosing another through-hole in one of even numbered bent portions as counted from an inlet side of the anode gas passage . However the Mizutani et al. reference discloses a through-hole provided at the first even numbered bent portion (Fig. 5a and 5b) counted from the cathode and anode inlet except for the most downstream bent portion. The Mizutani et al. reference discloses that these anode and cathode flow paths would benefit the fuel cell by reduction of pressure drop in contrast to the conventional long serpentine flow fields which would increase efficiency(4:50-65). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a through-

hole provided an even numbered bent portion (Fig. 5a and 5b) counted from the cathode and anode inlet that this would allow reactant passage as disclosed by the Mizutani et al. reference for the bent portions of the long serpentine flow passages as disclosed by the Mizutani et al. reference in order to reduce pressure resistance and to optimize power output with superior performances.

Response to Arguments

15. Applicant's arguments filed 6/7/10 have been fully considered but they are not persuasive. Applicants' principal arguments are:

a. The Applicants argue, "*Specifically, the fuel cell stack in claim 9 requires a flow in the cathode gas passage and a flow in the anode gas passage in parallel and also in opposite directions to each other. Further, a through-hole is provided in a most downstream bent portion in at least one of the anode gas passage and the cathode gas passage so as to allow movement of moisture through the fuel cells. An object of the present invention, i.e., uniformizing the water distribution in the fuel cell to thereby achieve an improvement in terms of flooding prevention performance, is accordingly accomplished by this unique configuration of the fuel cell stack.*" However, the Wada et al. reference does disclose the flow of the anode and cathode flow into the gas passages to be parallel as can be seen in Fig. 6 and a direction opposite of each other which can be seen in Fig. 5 and Fig. 8 illustrated by the dotted line on the and the solid line. As can be seen the solid line and the dotted line are going in a direction opposite from each other from the

inlet to the outlet. In addition, the "bent" portions are interpreted by the Examiner as the flow passage turning into a perpendicular flow path and into another flow passage parallel to the first flow passage, therefore the Wada et al. reference does disclose "a through-hole provide in a most downstream bent portion" which comprises the outlet. Furthermore, the arguments comprising "*uniformizing the water distribution in the fuel cell to thereby achieve an improvement in terms of flooding prevention performance, is accordingly accomplished by this unique configuration of the fuel cell stack*" are not claimed and therefore have been considered but are moot.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HELEN O.K. CONLEY whose telephone number is (571)272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Helen O.K. Conley/
Examiner, Art Unit 1795